Product Overview

High Conductivity Aluminium Alloy Conductors (AAAC) are stranded overhead conductors manufactured from high-conductivity aluminium alloy wires. Available in several alloy grades, including AL5, AL6, AL7, AL57, AL59, and Alloy 1120, they are designed to combine good electrical conductivity with favorable mechanical properties.

Compared with conventional Aluminium Conductor Steel Reinforced (ACSR), high-conductivity AAAC can offer a lower conductor weight, good strength-to-weight characteristics, reduced electrical losses, and enhanced corrosion resistance, depending on the selected alloy grade and conductor design.

Their favorable electrical and sag-tension characteristics make them suitable for medium-, high-, and extra-high-voltage overhead transmission lines. They are particularly useful in applications where electrical efficiency, mechanical performance, and resistance to environmental corrosion are important.

Conductor Construction

High Conductivity AAAC consists of all-aluminium alloy wires concentrically stranded to form a uniform overhead conductor.

- **Conductor Material:** High-conductivity aluminium alloy
- **Available Alloy Grades:** AL5, AL6, AL7, AL57, AL59, and Alloy 1120
- **Construction:** Concentric-lay stranded aluminium alloy wires
- **Conductor Configuration:** Available in different strand numbers and cross-sectional areas
- **Optional Protection:** Grease filling during stranding, subject to product specification

The alloy grade, wire configuration, and conductor size can be selected according to the required electrical and mechanical performance.

Applications

High Conductivity AAAC conductors are primarily used in overhead power transmission networks requiring good electrical performance, favorable sag-tension characteristics, and corrosion resistance.

Typical applications include:

- **Medium-Voltage Transmission Lines:** Overhead conductors for medium-voltage power networks.
- **High-Voltage Transmission Lines:** Utility transmission systems requiring efficient power transfer.
- **Extra-High-Voltage Transmission Lines:** Selected EHV applications according to project design requirements.
- **Corrosive Environments:** Overhead networks exposed to coastal, industrial, or other demanding environmental conditions.
- **Power Network Expansion:** New transmission infrastructure and utility network upgrades.

Key Advantages & Benefits

- **High Electrical Conductivity:** Multiple alloy grades are available to meet different electrical performance requirements.

★ Address: West Industrial Park, Zhulin Town, Gongyi City, Henan Province, China. ★
★ Tel:+86-371-5502-1747 Mob:+86-173-3570-4553 www.qzcablegroup.com E-mail: info@qzcablegroup.com ★

- **Lower Electrical Losses:** Low conductor resistance can help reduce ohmic losses under comparable operating conditions.
- **Favorable Strength-to-Weight Ratio:** Aluminium alloy construction provides a useful combination of mechanical strength and conductor weight.
- **Good Sag-Tension Performance:** Suitable mechanical characteristics support overhead line design and installation.
- **Corrosion Resistance:** Aluminium alloy conductors offer good resistance to atmospheric corrosion and can provide advantages over conventional ACSR in suitable environments.
- **Lightweight Construction:** An all-aluminium alloy structure can reduce conductor weight compared with certain steel-reinforced designs.
- **Recyclable Material:** Aluminium alloy conductors can be recycled at the end of their service life.

Available Aluminium Alloy Grades

QZ Cable's high-conductivity AAAC product range covers several aluminium alloy grades. The following conductivity values are reference catalogue data.

Alloy Grade	Reference Electrical Conductivity
AL5	55.25% IACS
AL6	55.6% IACS
AL7	57.5% IACS
AL57	57.0% IACS
AL59	58.84% IACS
Alloy 1120	58.84% IACS

Note: Conductivity values are indicative catalogue figures. Final guaranteed values should be confirmed against the applicable alloy specification, material condition, and production requirements.

The reference catalogue indicates the following product range:

Description	Reference Range
Conductor Cross-Sectional Area	10.6–1095 mm²
Conductor Construction	7–91 aluminium alloy wires
Available Alloy Grades	AL5, AL6, AL7, AL57, AL59, Alloy 1120

Actual available sizes and strand configurations are subject to the selected alloy grade, applicable standard, and manufacturing requirements.

Physical Properties

The reference catalogue provides the following mechanical properties for different conductor constructions.

Conductor Construction	Modulus of Elasticity (MPa)	Modulus of Elasticity (ksi)	Linear Coefficient of Expansion (/°C)	Linear Coefficient of Expansion (/°F)
7 Strands	62,000	8,992	23×10^{-6}	12.8×10^{-6}

★ Address: West Industrial Park, Zhulin Town, Gongyi City, Henan Province, China. ★
★ Tel:+86-371-5502-1747 Mob:+86-173-3570-4553 www.qzcablegroup.com E-mail: info@qzcablegroup.com ★

19 Strands	60,000	8,702	23 × 10^{-6}	12.8 × 10^{-6}
37 Strands	57,000	8,267	23 × 10^{-6}	12.8 × 10^{-6}
61 Strands	55,000	7,977	23 × 10^{-6}	12.8 × 10^{-6}

Reference Density: 2.703 g/cm³ for hard-drawn aluminium at 20°C (68°F).

Operating Temperature

The reference catalogue specifies the following temperature limits:

Operating Condition	Reference Temperature
Permissible Temperature in Continuous Operation	85°C (185°F)
Short-Circuit Temperature (up to 5 seconds)	200°C (392°F)

Note: The above physical properties and temperature values are informative catalogue parameters. Their applicability should be verified for the selected alloy grade, conductor construction, and project requirements.

Applicable Standards

High Conductivity Aluminium Alloy Conductors can be supplied according to applicable national and international standards, subject to technical confirmation.

- SS 424 08 14
- SS 424 08 12
- AS 1531
- BS EN 50182:2001
- IS 398 Part 6

The applicable standard and its edition should be specified when requesting a quotation.

Why Choose QZ Cable?

QZ Cable supplies overhead conductors for power transmission and distribution projects, with product configurations based on customer specifications and applicable standards.

- Direct manufacturer supply
- Multiple aluminium alloy grades
- Different conductor sizes and stranding configurations
- Technical specifications tailored to project requirements
- Optional grease filling where specified
- Support for utility, EPC, and bulk procurement projects

Contact QZ Cable with your required alloy grade, conductor cross-section, applicable standard, and order quantity for technical information and a quotation.

★ Address: West Industrial Park, Zhulin Town, Gongyi City, Henan Province, China. ★
★ Tel:+86-371-5502-1747 Mob:+86-173-3570-4553 www.qzcablegroup.com E-mail: info@qzcablegroup.com ★

Frequently Asked Questions

1. What is a High Conductivity Aluminium Alloy Conductor?

It is an overhead conductor made from stranded aluminium alloy wires, designed to provide good electrical conductivity and favorable mechanical properties for power transmission networks.

2. Which alloy grades are available?

The reference product range includes AL5, AL6, AL7, AL57, AL59, and Alloy 1120. Availability is subject to the confirmed manufacturing specification.

3. What is the conductivity of AL7 alloy?

The reference catalogue lists AL7 at 57.5% IACS. The guaranteed value should be confirmed against the applicable material specification.

4. What are the advantages of AAAC compared with ACSR?

Depending on the selected design and operating conditions, AAAC can offer lower weight, good electrical performance, and improved corrosion resistance compared with ACSR. A complete technical comparison should also consider tensile strength, DC resistance, sag, and current-carrying capacity.

5. What applications are suitable for High Conductivity AAAC?

These conductors are primarily used in medium-, high-, and extra-high-voltage overhead transmission lines. They can also be considered for distribution applications where the electrical and mechanical design requirements are satisfied.

6. Can AAAC be customized according to project requirements?

Yes. Conductor size, alloy grade, strand configuration, and applicable standard can be discussed according to project specifications and confirmed production capabilities.

Technical Specifications

ALUMINUM ALLOY CONDUCTORS (TYPE- AL5) EN 50182

★ Address: West Industrial Park, Zhulin Town, Gongyi City, Henan Province, China. ★
★ Tel:+86-371-5502-1747 Mob:+86-173-3570-4553 www.qzcablegroup.com E-mail: info@qzcablegroup.com ★

Code	Old Code	Sectional Area	Stranding		Conductor Diameter	Weight	Rated Strength	DC Resistance @ 20°C	Current Capacity	
			No. of Aluminium Wires	Individual wire diameter					@ 75°C	@ 85°C
		(mm²)	(No.)	(mm)	(mm)	(Kg/Km)	KN	(Ω/Km)	(Ampere)	(Ampere)
239-AL5	POPLAR	239.4	37	2.87	20.1	659.4	70.61	0.133	384	477
303-AL5	SYCAMORE	303.2	37	3.23	22.6	835.2	89.44	0.105	439	549
362-AL5	UPAS	362.1	37	3.53	24.7	997.5	106.82	0.0879	485	610
479-AL5	YEW	479	37	4.06	28.4	1319.6	141.31	0.0665	566	720
498-AL5	TOTARA	498.1	37	4.14	29	1372.1	146.93	0.0639	579	737
587-AL5	RUBUS	586.9	61	3.50	31.5	1622.0	173.13	0.0544	632	810
659-AL5	SORBUS	659.4	61	3.71	33.4	1822.5	194.53	0.0484	673	867
821-AL5	ARAUCARIA	821.1	61	4.14	37.3	2269.4	242.24	0.0389	754	982
996-AL5	REDWOOD	996.2	61	4.56	41	2753.2	293.88	0.0321	831	1092

ALUMINUM ALLOY CONDUCTORS (TYPE- AL6) EN 50182

Code	Old Code	Sectional Area	Stranding		Conductor Diameter	Weight	Rated Strength	DC Resistance @ 20°C	Current Capacity	
			No. of Aluminium Wires	Individual wire diameter					@ 75°C	@ 85°C
		(mm²)	(No.)	(mm)	(mm)	(Kg/Km)	KN	(Ω/Km)	(Ampere)	(Ampere)
65-AL6	AL56 - 65	65.1	7	3.44	10.3	177.6	20.43	0.4818	180	217
93-AL6	AL56 - 93	92.9	7	4.11	12.3	253.5	28.23	0.3375	222	270
130-AL6	AL56 - 130	129.9	7	4.86	14.6	354.5	39.48	0.2414	271	331
167-AL6	AL56 - 167	167.5	19	3.35	16.8	459.8	52.59	0.1882	314	386
178-AL6	AL56 - 178	177.6	19	3.45	17.3	487.6	55.77	0.1775	325	400

★ Address: West Industrial Park, Zhulin Town, Gongyi City, Henan Province, China. ★
★ Tel:+86-371-5502-1747 Mob:+86-173-3570-4553 www.qzcablegroup.com E-mail: info@qzcablegroup.com ★

Code	Old Code	Sectional Area	Stranding		Conductor Diameter	Weight	Rated Strength	DC Resistance @ 20°C	Current Capacity	
			No. of Aluminium Wires	Individual wire diameter					@ 75°C	@ 85°C
		(mm²)	(No.)	(mm)	(mm)	(Kg/Km)	KN	(Ω/Km)	(Ampere)	(Ampere)
210-AL6	AL56 - 210	209.8	19	3.75	18.8	576.1	63.79	0.1502	357	442
225-AL6	AL56 - 225	224.7	19	3.88	19.4	616.7	68.29	0.1403	371	461
263-AL6	AL56 - 263	263.2	19	4.20	21	722.7	80.02	0.1197	407	507
280-AL6	AL56 - 280	279.8	19	4.33	21.7	768.1	85.05	0.1127	421	526
322-AL6	AL56 - 322	322.2	37	3.33	23.3	887.7	101.18	0.0982	456	571
342-AL6	AL56 - 342	341.9	37	3.43	24	941.8	107.35	0.0925	471	592
444 -AL6	AL56 - 444	444.3	37	3.91	27.4	1223.9	135.06	0.0712	545	691
454-AL6	AL56 - 454	454.5	61	3.08	27.7	1256.1	142.71	0.0698	551	700
594-AL6	AL56 - 594	593.6	61	3.52	31.7	1640.6	180.46	0.0535	638	818
685-AL6	AL56 - 685	684.5	61	3.78	34	1891.9	208.1	0.0464	688	887
865-AL6	AL56 - 865	865.4	61	4.25	38.3	2391.6	263.07	0.0367	777	1014

ALUMINUM ALLOY CONDUCTORS (TYPE- AL7) EN 50182

Code	Old Code	Sectional Area	Stranding		Conductor Diameter	Weight	Rated Strength	DC Resistance @ 20°C	Current Capacity	
			No. of Aluminium Wires	Individual wire diameter					@ 75°C	@ 85°C
		(mm²)	(No.)	(mm)	(mm)	(Kg/Km)	KN	(Ω/Km)	(Ampere)	(Ampere)
65-AL7	AL58 - 65	65.1	7	3.44	10.3	177.6	17.89	0.4662	183	221
93-AL7	AL58 - 93	92.9	7	4.11	12.3	253.5	23.68	0.3266	226	274
130-AL7	AL58 - 130	129.9	7	4.86	14.6	354.5	33.11	0.2336	275	336
167-AL7	AL58 - 167	167.5	19	3.35	16.8	459.8	46.05	0.1821	319	393

★ Address: West Industrial Park, Zhulin Town, Gongyi City, Henan Province, China. ★
★ Tel:+86-371-5502-1747 Mob:+86-173-3570-4553 www.qzcablegroup.com E-mail: info@qzcablegroup.com ★

Code	Old Code	Sectional Area	Stranding		Conductor Diameter	Weight	Rated Strength	DC Resistance @ 20°C	Current Capacity	
			No. of Aluminium Wires	Individual wire diameter					@ 75°C	@ 85°C
		(mm²)	(No.)	(mm)	(mm)	(Kg/Km)	KN	(Ω/Km)	(Ampere)	(Ampere)
178-AL7	AL58 - 178	177.6	19	3.45	17.3	487.6	48.84	0.1717	330	407
210-AL7	AL58 - 210	209.8	19	3.75	18.8	576.1	55.61	0.1454	363	450
225-AL7	AL58 - 225	224.7	19	3.88	19.4	616.7	59.53	0.1358	378	468
263-AL7	AL58 - 263	263.2	19	4.20	21	722.7	67.12	0.1159	413	515
280-AL7	AL58 - 280	279.8	19	4.33	21.7	768.1	71.34	0.109	428	534
322-AL7	AL58 - 322	322.2	37	3.33	23.3	887.7	88.62	0.095	463	580
342-AL7	AL58 - 342	341.9	37	3.43	24	941.8	94.02	0.0895	479	601
444-AL7	AL58 - 444	444.3	37	3.91	27.4	1223.9	117.73	0.0689	554	703

ALUMINUM ALLOY CONDUCTORS (TYPE- AL57) SS 42408 12

Code	Old Code	Sectional Area	Stranding		Conductor Diameter	Weight	Rated Strength	DC Resistance @ 20°C	Current Capacity	
			No. of Aluminium Wires	Individual wire diameter					@ 75°C	@ 85°C
		(mm²)	(No.)	(mm)	(mm)	(Kg/Km)	KN	(Ω/Km)	(Ampere)	(Ampere)
31	31.14	17.9	7	2.38	7.14	85.0	9.31	0.974	118	140
62	62.44	35.88	7	3.37	10.11	170.0	17.2	0.486	178	214
99	99.3	57.07	7	4.25	12.75	271.0	25.3	0.305	234	285
157	158.59	91.14	19	3.26	16.3	436.0	43.7	0.193	307	377
241	241.16	138.59	19	4.02	20.1	663.0	61.6	0.127	391	485
329	330.03	189.67	37	3.37	23.6	910.0	90.7	0.0928	467	586
454	454.49	261.2	61	3.08	27.72	1260.0	125.16	0.0675	558	708
593	593.62	341.15	61	3.52	31.68	1640.0	157	0.0517	645	827
774	774.24	444.96	61	4.02	36.18	2140.0	197	0.0396	743	963
910	910.74	523.4	61	4.36	39.2	2520.0	232	0.0337	806	1054

ALUMINUM ALLOY CONDUCTORS (TYPE- AL59) SS 42408 14

★ Address: West Industrial Park, Zhulin Town, Gongyi City, Henan Province, China. ★
★ Tel:+86-371-5502-1747 Mob:+86-173-3570-4553 www.qzcablegroup.com E-mail: info@qzcablegroup.com ★

Code	Old Code	Sectional Area	Stranding		Conductor Diameter	Weight	Rated Strength	DC Resistance @ 20°C	Current Capacity	
			No. of Aluminium Wires	Individual wire diameter					@ 75°C	@ 85°C
		(mm²)	(No.)	(mm)	(mm)	(Kg/Km)	KN	(Ω/Km)	(Ampere)	(Ampere)
31	31.14	18.48	7	2.38	7.14	85.0	7.77	0.943	120	142
62	62.44	37.06	7	3.37	10.11	170.0	15.6	0.47	181	218
99	99.3	58.93	7	4.25	12.75	271.0	22.8	0.296	238	289
157	158.59	94.12	19	3.26	16.3	436.0	39.7	0.186	313	384
241	241.16	143.13	19	4.02	20.1	663.0	55.5	0.123	397	493
329	330.03	195.87	37	3.37	23.6	910.0	82.5	0.0899	475	595
454	454.49	269.74	61	3.08	27.72	1260.0	113	0.0654	567	719
593	593.62	352.31	61	3.52	31.68	1640.0	143	0.0501	655	840
774	774.24	459.51	61	4.02	36.18	2140.0	178	0.0384	754	977
910	910.74	540.52	61	4.36	39.2	2520.0	209	0.0326	819	1070

ALUMINUM ALLOY CONDUCTORS (TYPE- AAAC 1120) AS 1531

Code Name	Sectional Area	Equivalent Aluminum area	Stranding		Diameter of Complete Conductor	Weight	Rated Strength	DC Resistance @ 20°C	Current Capacity	
			No. of Aluminium Wires	Individual wire diameter					@ 75°C	@ 85°C
	(mm²)	(mm²)	(No.)	(mm)	(mm)	(Kg/Km)	KN	(Ω/Km)	(Ampere)	(Ampere)
Chlorine	34.36	32.80	7	2.50	7.50	94.3	8.18	0.8640	126	150
Chromium	41.58	39.70	7	2.75	8.25	113.0	9.91	0.7130	141	169
Fluorine	49.48	47.20	7	3.00	9.00	135.0	11.80	0.5990	156	188
Helium	77.28	73.70	7	3.75	11.30	211.0	17.60	0.3830	204	247
Hydrogen	111.30	106.00	7	4.50	13.50	304.0	24.30	0.2660	253	308
Iodine	124.00	118.00	7	4.75	14.30	339.0	27.10	0.2390	269	329
Krypton	157.60	150.00	19	3.25	16.30	433.0	37.40	0.1890	309	380
Lutetium	182.80	173.00	19	3.50	17.50	503.0	41.70	0.1630	337	415
Neon	209.80	199.00	19	3.75	18.80	576.0	47.80	0.1420	365	451
Nitrogen	261.60	248.00	37	3.00	21.00	721.0	62.20	0.1140	414	515
Nobelium	307.00	291.00	37	3.25	22.80	845.0	72.80	0.0973	453	567
Oxygen	336.70	320.00	19	4.75	23.80	924.0	73.60	0.0884	478	599
Phosphorus	408.50	387.00	37	3.75	26.30	1 120	93.10	0.0731	532	672
Selenium	506.10	478.00	61	3.25	29.30	1 400	114.00	0.0592	598	761
Silicon	586.90	555.00	61	3.50	31.50	1 620	127.00	0.0511	647	829

★ Address: West Industrial Park, Zhulin Town, Gongyi City, Henan Province, China. ★
★ Tel:+86-371-5502-1747 Mob:+86-173-3570-4553 www.qzcablegroup.com E-mail: info@qzcablegroup.com ★

Code Name	Sectional Area	Equivalent Aluminum area	Stranding		Diameter of Complete Conductor	Weight	Rated Strength	DC Resistance @ 20°C	Current Capacity	
			No. of Aluminium Wires	Individual wire diameter					@ 75°C	@ 85°C
	(mm^2)	(mm^2)	(No.)	(mm)	(mm)	(Kg/Km)	KN	(Ω/Km)	(Ampere)	(Ampere)
Sulfur	673.40	636.00	61	3.75	33.80	1 860	145.00	0.0444	697	898

★ Address: West Industrial Park, Zhulin Town, Gongyi City, Henan Province, China. ★
★ Tel:+86-371-5502-1747 Mob:+86-173-3570-4553 www.qzcablegroup.com E-mail: info@qzcablegroup.com ★